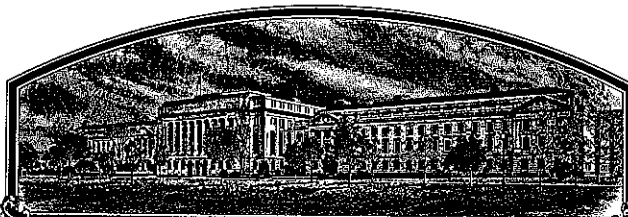


No.

9500013



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Western Plant Breeders

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED, PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE FOREGOING PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'Cortez'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this thirty-first day of October in the year of our Lord one thousand nine hundred and ninety-five.

Attest:

Martha A. Funder

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Samuel J. Flickman

Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421) information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) Western Plant Breeders, Inc.		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO. PH888-103-3	3. VARIETY NAME CORTEZ
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) 8111 Timberline Drive Bozeman, MT 59715		5. PHONE (include area code) (406) 587-1218	FOR OFFICIAL USE ONLY PVPO NUMBER 9500013 FILING Date Oct 17, 1994 Time <input type="checkbox"/> A.M. <input checked="" type="checkbox"/> P.M. FEE Filing and Examination Fee: \$ 2325.00 Date Oct 17, 1994 Certificate Fee: \$ 300.00 Date Oct 21, 1995
6. GENUS AND SPECIES NAME Triticum Durum	7. FAMILY NAME (Botanical) Gramineae		
8. CROP KIND NAME (Common Name) Durum Wheat	9. DATE OF DETERMINATION May 1, 1992		
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation			
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Arizona		12. DATE OF INCORPORATION August 24, 1990	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Kim C. Shantz Western Plant Breeders, 6720 W. Chicago Street # 4 Chandler, AZ 85226-3300			

PHONE (include area code): **(602) 940-7654**

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)

- a. ☒ Exhibit A, Origin and Breeding History of the Variety.
- b. ☒ Exhibit B, Novelty Statement.
- c. ☒ Exhibit C, Objective Description of Variety.
- d. ☐ Exhibit D, Additional Description of Variety.
- e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.
- f. ☒ Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office _____
- g. ☒ Filing and Examination Fee (\$2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act.)
☐ YES (If "YES," answer items 16 and 17 below) ☒ NO (If "NO," skip to item 18 below)

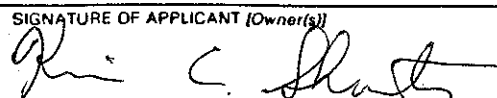
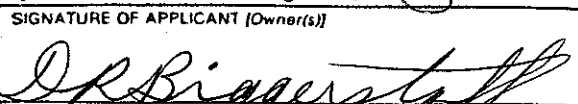
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ YES ☐ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ YES (If "YES," through ☐ Plant Variety Protection Act ☐ Patent Act. Give date: _____)
☒ NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
☐ YES (If "YES," give names of countries and dates)
☒ NO

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.
 The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.
 Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT (Owner(s)) 	CAPACITY OR TITLE Wheat Breeder	DATE 9/16/94
SIGNATURE OF APPLICANT (Owner(s)) 	CAPACITY OR TITLE General Manager	DATE 9-30-94

14a.

Breeding History

CORTEZ is a spring durum wheat selected from a Western Plant Breeders generated composite cross designated Turbo Alpha-86 CHA made in 1986. Turbo alpha-86 CHA was formed by crossing WestBred Turbo with advanced high quality durum lines treated with a Chemical hybridizing Agent (CHA). Thirty five crosses were bulked together and the F1 was grown at Bozeman, Montana in 1986. Two generations were grown each year and the F4 head rows were planted at Phoenix, AZ in 1988. One row designated Cortez was harvested in bulk and yield tested in the desert durum area in 1989, 1990, and 1991. In 1990, 32 spikes were selected and grown as head row plots at Bozeman, Montana. Five uniform, nonsegregating rows were selected and grown as head row plots at Phoenix, Arizona in 1991. One plot, designated PH888-103-3, was selected and tested.

CORTEZ was tested in 1992 and was not found to differ in any significant way from the F4, 8 bulk PH888-103. The PH888-103-3 plot was increased at Phoenix, Arizona in 1992 and the resulting seed was used to produce foundation seed at Yuma in 1993.

A variant that is similar to Cortez but is 10cm. to 15cm. taller and occurs at a frequency of .06%.

CORTEZ is a stable and uniform cultivar in agronomic appearance and performance across several generations and growing conditions. Agronomic data to support stability is presented in the tables. The selection criteria used during the breeding of Cortez were high yield, higher protein than WestBred Turbo, good test weight, semi-dwarf growth habit, acceptable flowering date, better semolina color than WestBred Turbo, good sedimentation values, higher hard amber vitreous counts than WestBred Turbo and excellent lodging resistance.



Western Plant Breeders

"Breeders of WestBred™ Varieties"

9500013

April 29, 1995

Mr. Alan A. Atchley
USDA/AMS/SD
Plant Variety Protection Office
10301 Baltimore Blvd.
Beltsville, MD 20705-2351

SUBJECT: PV Application 9500013, Wheat variety 'Cortez'

Dear Alan:

Addendum to Exhibit A: Stability and uniformity have been observed in Cortez over four generations.

Revised Exhibit E: The variety 'Cortez' for which Plant Variety Protection is hereby sought was developed by Kim C. Shantz, an employee of Western Plant Breeders, Inc., all rights to any invention, discovery, or development made by the employee while employed by Western Plant Breeders, Inc., were assigned to Western Plant Breeders, Inc. with no rights of any kind retained by the employee.

Western Plant Breeders, Inc. requests that the variety 'Cortez' be issued a certificate of Plant Variety Protection under the revised PVP act of 1994.

Sincerely,

Kim Shantz
Wheat Breeder

14b. Novelty Statement

CORTEZ is a day length insensitive spring durum wheat with an average height of 91 centimeters which is 5 centimeters shorter than WestBred Turbo. Cortez most resembles WestBred Turbo but differs in that Cortez has purple anthers while WestBred Turbo has yellow anthers. Cortez has purple auricles while WestBred Turbo has white auricles. Cortez has apiculate glume shoulders while WestBred Turbo has square shoulders. Cortez has hairiness of the last internode of the rachis while WestBred Turbo does not. Cortez has green colored leaves with waxy bloom. The flag leaf at booting is erect and not twisted. The stems are white, strong, and hollow with waxy bloom. The spikes are long, midwide, dense, erect, and oblong with long black awns. The awns fade rapidly at maturity. The glume shoulders are narrow and apiculate. The glume beaks are narrow, medium length, and acuminate. The white glumes have heavy pubescence. Cortez has long, wide, and elliptical seed with short large, and non-collared brushes. The crease is midwide and shallow. The checks are rounded and the germ size is large. The above comparisons along with the objective description (14c) show Cortez to be a novel variety of durum wheat.

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN AND SEED DIVISION
BELTSVILLE, MARYLAND 20785

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY

WHEAT (TRITICUM SPP.)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)

Western Plant Breeders, Inc.

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)

8111 Timberline Drive
Bozeman, MT 59715

FOR OFFICIAL USE ONLY

PVPO NUMBER 2500015

VARIETY NAME OR TEMPORARY DESIGNATION

PH888-103-3 CORTEZ

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. or) when number is either 99 or less or 9 or less.

1. KIND:

1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

1 = SPRING 2 = WINTER 3 = OTHER (Specify) 1 = SOFT 2 = HARD 3 = OTHER (Specify)

1 = WHITE 2 = RED 3 = OTHER (Specify)

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

FIRST FLOWERING LAST FLOWERING

4. MATURITY (50% Flowering):

NO. OF DAYS EARLIER THAN 1 = ARTHUR 2 = SCOUT 3 = CHRIS
 NO. OF DAYS LATER THAN 4 = LEMHI 5 = NUGAINE 6 = LEEDS
7 = WestBred Turbo

5. PLANT HEIGHT (From soil level to top of head):

CM. HIGH 7 = Aldura 8 = WestBred Turbo
 CM. TALLER THAN
 CM. SHORTER THAN 1 = ARTHUR 2 = SCOUT 3 = CHRIS
4 = LEMHI 5 = NUGAINE 6 = LEEDS

6. PLANT COLOR AT BOOTING (See reverse):

1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTER COLOR:

1 = YELLOW 2 = PURPLE

8. STEM:

Anthocyanin: 1 = ABSENT 2 = PRESENT Waxy bloom: 1 = ABSENT 2 = PRESENT
 Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT Internodes: 1 = HOLLOW 2 = SOLID
 NO. OF NODES (Originating from node above ground) CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

Anthocyanin: 1 = ABSENT 2 = PRESENT Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER (Specify): Flag leaf: 1 = NOT TWISTED 2 = TWISTED
 Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
 MM. LEAF WIDTH (First leaf below flag leaf) CM. LEAF LENGTH (First leaf below flag leaf):

Table 1

Yield in pounds per acre of CORTEZ and presently grown varieties in Western Plant Breeders' trials.

<u>Location</u>	<u>Year</u>	<u>PH888-169</u>	<u>WestBred Turbo</u>	<u>Yavaros 79</u>	<u>CORTEZ</u>
Phoenix, AZ	1989	6682	7654	6521	7347
	1990	7258	7616	6643	7488
	1991	9574	8934	8384	8474
	1992	7322	7616	7565	7616
Phoenix, Late AZ	1990	5594	6003	6362	5274
	1991	7309	8166	7923	7846
	1992	5537	4956	5346	5574
El Centro, CA	1990	6003	6200	5440	5680
	1991	8621	8141	8022	8494
	1992	5394	6132	4902	6397
San Joaquin, CA	1990	8078	8459	8582	8405
	1991	8470	8712	8204	6945
Yuma, AZ	1992	<u>6816</u>	<u>8035</u>	<u>6631</u>	<u>7861</u>
		7150	7433	6963	7185

Table 2

Percent protein of CORTEZ and presently grown varieties in Western Plant Breeders' trials.

<u>Location</u>	<u>Year</u>	<u>PH888-169</u>	<u>WestBred</u>		<u>CORTEZ</u>
			<u>Turbo</u>	<u>Yavaros 79</u>	
Phoenix, AZ	1989	13.8	12.9	11.8	13.6
	1990	13.2	12.7	12.5	13.5
	1991	14.3	14.1	12.8	14.8
	1992	12.4	11.9	11.5	12.5
Phoenix, Late AZ	1990	13.7	13.5	11.9	14.5
	1991	14.3	13.4	12.2	14.6
	1992	13.8	14.2	13.6	14.3
El Centro, CA	1990	10.2	9.9	10.1	10.5
	1991	14.7	14.1	13.2	14.7
	1992	14.7	14.5	13.3	15.0
San Joaquin, CA	1990	12.6	12.1	11.7	12.5
	1991	13.9	13.2	12.8	14.9
Yuma, AZ	1992	<u>14.7</u>	<u>14.0</u>	<u>13.3</u>	<u>14.8</u>
		13.6	13.1	12.4	13.9

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Table 3

Semolina color of CORTEZ and presently grown varieties in Western Plant Breeders' trials.*

<u>Location</u>	<u>Year</u>	<u>PH888-169</u>	<u>WestBred</u>		<u>CORTEZ</u>
			<u>Turbo</u>	<u>Yavaros 79</u>	
Phoenix, AZ	1989	2.0	2.5	3.0	2.0
	1990	2.0	3.0	3.5	2.0
	1991	2.0	2.5	3.0	2.0
	1992	2.5	3.0	3.7	2.8
Phoenix, Late AZ	1990	2.5	3.0	3.5	2.5
	1991	2.0	2.5	3.0	2.0
	1992	2.6	2.7	3.3	2.7
El Centro, CA	1990	2.0	3.0	3.3	2.0
	1991	2.5	3.0	3.5	2.0
	1992	2.5	3.3	4.0	2.3
San Joaquin, CA	1990	2.0	3.0	4.0	2.5
	1991	2.0	2.5	3.5	2.5
Yuma, AZ	1992	<u>3.0</u>	<u>3.0</u>	<u>4.0</u>	<u>2.7</u>
		2.3	2.8	3.5	2.3

* Lower number is better.

1 = excellent semolina color

5 = poor semolina color

Table 4

Sedimentation of CORTEZ and presently grown varieties in Western Plant Breeders' trials.

<u>Location</u>	<u>Year</u>	<u>PH888-169</u>	<u>WestBred</u>		<u>CORTEZ</u>
			<u>Turbo</u>	<u>Yavaros 79</u>	
Phoenix, AZ	1989	33	30	24	31
	1990	33	27	24	28
	1991	33	30	26	30
	1992	34	33	28	31
Phoenix, Late AZ	1990	37	32	26	34
	1991	31	30	26	32
	1992	39	34	31	33
El Centro, CA	1990	31	33	25	31
	1991	35	32	27	33
	1992	40	35	29	39
San Joaquin, CA	1990	30	31	24	31
	1991	35	32	30	33
Yuma, AZ	1992	<u>36</u>	<u>34</u>	<u>30</u>	<u>35</u>
		34.4	31.8	26.9	32.4

Table 5

Plant height of CORTEZ and presently grown varieties in Western Plant Breeders' trials. (Inches)

<u>Location</u>	<u>Year</u>	<u>PH888-169</u>	<u>WestBred</u>		<u>CORTEZ</u>
			<u>Turbo</u>	<u>Yavaros 79</u>	
Phoenix, AZ	1989	32	38	33	34
	1990	33	35	39	38
	1991	37	37	38	39
	1992	36	42	39	37
Phoenix, Late AZ	1990	34	37	37	36
	1991	35	40	38	37
El Centro, CA	1990	32	36	34	31
	1991	38	38	37	37
	1992	36	36	38	36
San Joaquin, CA	1990	35	37	37	35
	1991	<u>36</u>	<u>39</u>	<u>38</u>	<u>39</u>
		34.9	37.7	37.1	36

Table 6

Days to anthesis after March 1 of CORTEZ and presently grown varieties in Western Plant Breeders' trials.

<u>Location</u>	<u>Year</u>	<u>PH888-169</u>	<u>WestBred</u>		<u>CORTEZ</u>
			<u>Turbo</u>	<u>Yavaros 79</u>	
Phoenix, AZ	1989	27	27	23	27
	1990	31	30	27	31
	1991	39	34	28	37
Phoenix, Late AZ	1991	49	45	44	47

Table 7

9500013

Percent lodging of CORTEZ and presently grown varieties in Western Plant Breeders' trials.

<u>Location</u>	<u>Year</u>	<u>PH888-169</u>	WestBred <u>Turbo</u>	<u>Yavaros 79</u>	<u>CORTEZ</u>
Phoenix, AZ	1990	25	60	83	20
	1991	3	63	53	13
	1992	13	58	48	18
Phoenix, Late AZ	1990	0	25	25	0
	1991	0	20	50	0
El Centro, CA					
	1991	0	30	13	0
	1992	0	53	73	0
San Joaquin, CA	1990	38	28	58	3
Yuma	1992	<u>28</u> 12%	<u>65</u> 45%	<u>85</u> 54%	<u>25</u> 9%

Table 8

Hard amber vitreous counts of CORTEZ and presently grown varieties in Western Plant Breeders' trials.

<u>Location</u>	<u>Year</u>	<u>PH888-169</u>	WestBred <u>Turbo</u>	<u>Yavaros 79</u>	<u>CORTEZ</u>
El Centro, CA	1990	41	27	21	43

Table 9

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Percent black point of CORTEZ and presently grown varieties in Western Plant Breeders' trials.

<u>Location</u>	<u>Year</u>	<u>PH888-169</u>	<u>WestBred</u>		<u>CORTEZ</u>
			<u>Turbo</u>	<u>Yavaros 79</u>	
Phoenix,AZ	1992	12	14	18	10
Yuma, AZ	1992	59	51	43	45
El Centro, CA	1992	41	54	35	21

Table 10

Quality of CORTEZ compared to WestBred Turbo in Western Plant Breeders' trials.

	<u>CORTEZ</u>				<u>WESTBRED TURBO</u>			
	1990		1991		1990		1991	
	<u>PHX</u>	<u>PHX Late</u>	<u>PHX</u>	<u>EL Centro</u>	<u>PHX</u>	<u>PHX Late</u>	<u>PHX</u>	<u>EL Centro</u>
Test Wgt	63.8	62.9	63.6	64.6	64.0	63.9	64.3	65.0
1000 K	49.5	445.7	51.8	55.9	55.2	49.5	56.2	57.1
Wht ash	1.66	1.67	1.49	1.60	1.63	1.51	1.48	1.45
Wht Pro	11.8	13.1	14.2	14.4	11.6	12.5	13.3	13.9
Total Extraction	79.8	80.9	63.6	83.6	70.0	81.0	83.5	82.8
Semolina Extraction	63.6	65.1	62.9	62.8	63.4	63.4	64.0	63.1
Specks	43	53	33	40	53	30	37	33
Semo ash	.70	.73	.56	.52	.75	.67	.54	.58
Dustcolor	90	90	95	85	80	85	85	80
Mixo Score	5	5	4	4	4	5	3	3
Semo pro	10.8	12.1	13.0	12.9	10.6	11.5	11.8	12.5
Visual color	10.0	10.0	9.5	9.5	10.5	10.0	8.5	8.0
Cook wgt	31.7	32.9	31.6	32.8	32.8	32.9	32.7	30.8
Firmness	5.7	5.9	6.2	6.3	5.5	6.2	5.4	6.1
Residue	7.2	6.4	6.4	6.3	7.4	6.4	6.5	6.5
Alveo graph W	--	--	131	136	--	--	103	103
P/L	--	--	2.7	2.0	--	--	3.3	1.9